

Name: _____ Date: _____

Polynomial Operations EXAM (version 112)

1. Let polynomials $p(x)$ and $q(x)$ be defined below.

$$p(x) = -9x^5 - 6x^4 + 4x^2 - 5x + 3$$

$$q(x) = -2x^5 - 7x^4 - x^3 - 9x^2 - 6$$

Express the difference $q(x) - p(x)$ in standard form.

2. Let polynomials $a(x)$ and $b(x)$ be defined below.

$$a(x) = 5x^2 - 7x + 3$$

$$b(x) = -3x + 2$$

Express the product $a(x) \cdot b(x)$ in standard form.

3. Express $(x + 1)^5$ in standard (expanded) form.

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4. Let polynomials $f(x)$ and $g(x)$ be defined below.

$$\begin{aligned}f(x) &= -x^3 + 6x^2 + 27x + 1 \\g(x) &= x - 9\end{aligned}$$

The quotient of $\frac{f(x)}{g(x)}$ can be expressed as a polynomial, $h(x)$, and a remainder, R (a real number).

$$\frac{f(x)}{g(x)} = h(x) + \frac{R}{x - 9}$$

By using synthetic division or long division, express $h(x)$ in standard form, and find the remainder R .

5. Let polynomial $f(x)$ still be defined as $f(x) = -x^3 + 6x^2 + 27x + 1$. Evaluate $f(9)$.